REMARKS

By this Amendment claims 1, 2, 3, and 8 have been amended to better define the intended subject matter (note with respect to the amendment to claim 2 that a Schroeder noise generator is mentioned on page 9 of the specification). Entry is requested.

In the outstanding Office Action the examiner has rejected claims 1 and 4-9 under 35 U.S.C. 103(a) as being unpatentable over Engebretson in view of Hansen and Gao et al., and he has rejected claims 2 and 3 under 35 U.S.C. 103(a) as being unpatentable over Engebretson in view of Borkowski et al.

The inventors assert that those rejections must be withdrawn.

Engebretson discloses an electronic filter for an electroacoustic system which is similar to the prior art discussed in the specification of the present application. The feature of "using an additional feedback cancellation filter and a noise generator for providing low frequency input for the LMS algorithm" is not disclosed therein as asserted by the examiner. The filter 109 identified as the additional feedback filter by the examiner is in fact the hearing aid filter by way of which the required frequency shaping of the signal is provided for the individual user. This is explained in column 7, line 44: "The output of combining circuit 107 is designated En and is supplied to a digital filter 109 operating according to

the data in RAM 49 of FIG. 3 to ameliorate the hearing deficiencies of the user."

Thus, asserting that the filter 109 in Engebretson as an additional feedback cancellation filter is not correct.

A noise generator 115 is provided according to Engebretson; however, the generator 115 is not used with an additional feedback cancellation filter for providing low-frequency input for the LMS algorithm as asserted by the examiner. The noise generator 115 in Engebretson is used to inject a noise signal Wi directly into the output signal, which will be presented as Xo directly to the ear of the user.

Thus, Engebretson does not disclose the parts of the claimed invention asserted by the examiner. It is novel to use an additional feedback cancellation filter and a noise generator for providing low-frequency input for the LMS algorithm, when at the same time the a high-pass filter is used to prevent low-frequency signals in the reference signal and in the error signal from reaching the LMS algorithm.

Following this, a combination of Engebretson and Hansen could not in any obvious way suggest to a person of ordinary skill the claimed invention because the use of an additional feedback cancellation filter and a noise generator for providing low frequency input for the LMS algorithm is not known from Engebretson.

For the same reason the combination of Gao and Engebretson would not suggest the claimed invention.

The Gao patent describes a method for adaptively cancelling acoustic feedback in hearing aids where the feedback cancellation is limited to a frequency band that encompasses all unstable frequencies. In column 12, lines 10-15, one of the drawbacks of the band limited feedback cancellation is described: ".. the low frequency gain of the ADF filter response may gradually build up if the chosen band-limiting filter BPF1 has excessive low frequency attenuation compared to the feedback path. In both cases the adaptive filter coefficients may overflow or saturate". According to Gao, the problem is solved by a DC removing module included to periodically remove the DC offset from the adaptive filter coefficients as explained in column 12, lines 16-17. As further explained on column 12, line 44, this DC removal may introduce audible distortion at the hearing aid output.

The invention defined in the present application seeks to solve similar problems relating to stability of a system with band limited operation of the LMS algorithm. A different solution than the one offered in Gao is proposed according to the invention. The applicants claim the use of an additional feedback cancellation filter and a noise generator for supplying the low frequency input for the LMS algorithm. This is novel over Gao. Also, there is nothing in Gao which could suggest to a person of ordinary skill a solution where the low-frequency input to the LMS

algorithm is supplied in this way, especially so as Gao teaches that no low frequency input should be supplied to the LMS algorithm. The present invention ensures that the LMS algorithm stays on track and does not become unstable, without introducing annoying acoustic artefacts on the output side.

No obvious combination of the contents of the cited prior art could suggest a method as claimed in claim 1, where an additional feedback cancellation filter and a noise generator is used for providing the required low-frequency input for the LMS algorithm, in order to assure the stability of the system.

The Borkowski patent cited by the examiner does not seem to have anything to do with the invention. It appears to be a generic noise generator which produces a noise signal by amplifying the thermal noise generated over a resistor. The noise produced by the noise generator will have a flat power spectral density level. The Schroeder noise generator used according to the invention will generate noise with a power spectrum corresponding to any input signal used.

According to the examiner the features of independent claim 8 are suggested by a combination of the features known from Engebretson in view of Hansen and Gao. As explained above, neither Gao nor Engebretson discloses the use of an additional feedback cancellation filter and a noise generator for providing low frequency input for the LMS algorithm. Also, the Hansen document does not disclose any of this.

Thus, the invention defined in claim 8 is new, and since it cannot be arrived at by any obvious combination of prior art, it is also believed to be patentable.

Favorable reevaluation is requested.

Respectfully submitted,

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